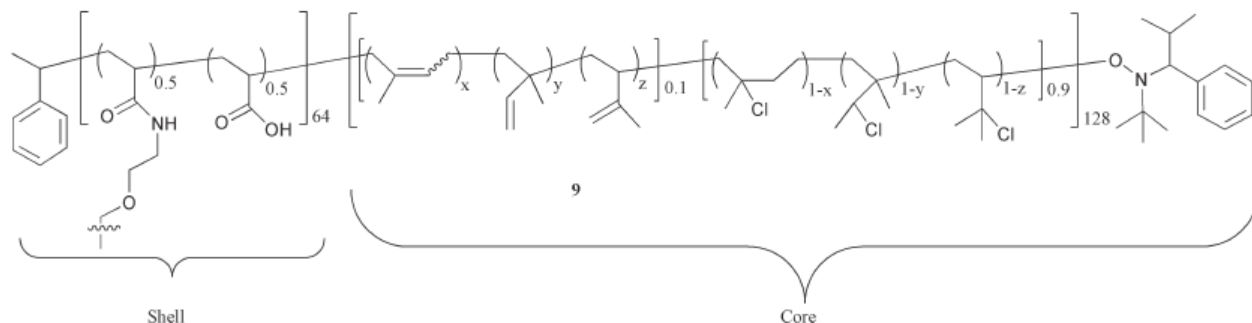


Fundamental Aspects of Shell-crosslinked Nanoparticles

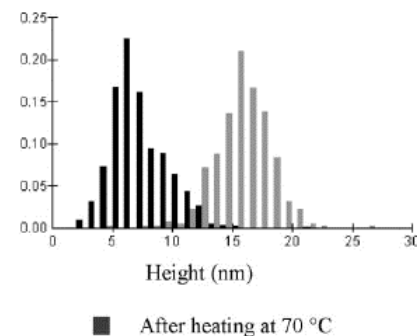
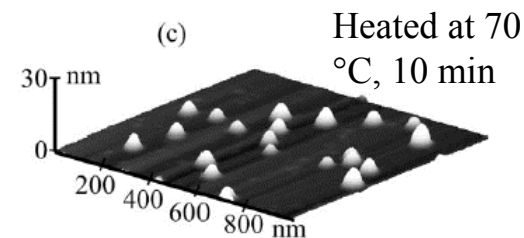
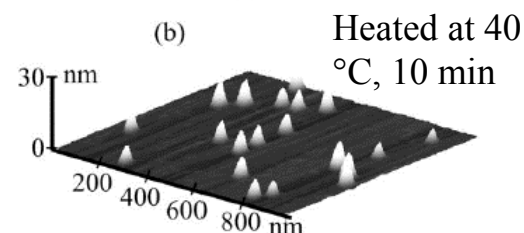
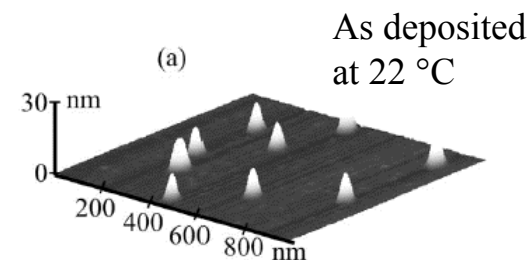
Karen L. Wooley, Washington University, DMR-9974457

The controlled shaping of shell-crosslinked (SCK) nanoparticles was accomplished. By tuning the thermal properties of the core domain, SCKs were shown to undergo a sphere-to-disc shaping at elevated temperatures and when adsorbed onto a substrate. Although demonstrated for mica as a flat substrate, complex shaping protocols are being devised by utilizing other templating substrates.

J. Mater. Chem., **2003**, *13*, 2785-95.



Thermally-shapable SCKs with core $T_g = 33\text{ }^{\circ}\text{C}$ were based upon hydrochlorinated polyisoprene surrounded by poly(acrylic acid-*co*-acrylamide). When deposited from aqueous solution at room temperature the SCKs are spherical and the shape change upon heating at $70\text{ }^{\circ}\text{C}$ is observed as a decreased in height as measured by atomic force microscopy.



Fundamental Aspects of Shell-crosslinked Nanoparticles

Karen L. Wooley, Washington University, DMR-9974457

Education:

This NSF support has provided for research and education activities for eight undergraduate students (six female, one from an underrepresented group), nine Ph.D. students (two female, one from an underrepresented group), four postdoctoral associates (one female), and two senior scientists. In each case, synthetic polymer chemistry and physical chemistry concepts were learned and applied to the preparation and study of shell-crosslinked nanoparticles.



Outreach:

In addition to being coursemaster for the Education 6009: Hands-on Outreach Course for K-8 Teachers, Wooley and her students have performed numerous school visits and visits by K-8 students to laboratories at Washington University.



At a May 2004 visit by Wilson School 2nd grade students to WUSTL, polymer chemistry concepts were discussed, six forms of slime were prepared and compared, and each student received an experimental toolbox and a pair of safety glasses.